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The Patent Office
Concept House
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South Wales
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GB/05/1196

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Signed J Evans.

Dated 26 April 2005

Patents Form 1/77

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THE PATENT OFFICE
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Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road
Newport
South Wales
NP10 8QQ

1. Your reference

BRIDM-1

2. Patent application number
(The Patent Office will fill this part in)

0406983.7

29 MAR 2004

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

PAUL BRISON,
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Patents ADP number *(if you know it)*

8838807001

If the applicant is a corporate body, give the country/state of its incorporation

4. Title of the invention

WIRELESS CONTROLLED ~~[illegible]~~ INTELLIGENT OUTDOOR DIMMER MODULE

5. Name of your agent *(if you have one)*

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

Patents ADP number *(if you know it)*

6. Priority: Complete this section if you are declaring priority from one or more earlier patent applications, filed in the last 12 months.

Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*

7. Divisionals, etc: Complete this section only if this application is a divisional application or resulted from an entitlement dispute (see note f)

Number of earlier UK application	Date of filing *(day / month / year)*

8. Is a Patents Form 7/77 (Statement of inventorship and of right to grant of a patent) required in support of this request?

NO

Answer YES if:

a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.

Otherwise answer NO (See note d)

Patents Form 1/77

9. Accompanying documents: A patent application must include a description of the invention. Not counting duplicates, please enter the number of pages of each item accompanying this form:

Continuation sheets of this form	
Description	2
Claim(s)	
Abstract	
Drawing(s)	1 + 1

10. If you are also filing any of the following, state how many against each item.

Priority documents	
Translations of priority documents	
Statement of inventorship and right to grant of a patent (Patents Form 7/77)	
Request for a preliminary examination and search (Patents Form 9/77)	
Request for a substantive examination (Patents Form 10/77)	
Any other documents (please specify)	

11. I/We request the grant of a patent on the basis of this application.

Signature(s) Paul Brison Date 26/3/04

12. Name, daytime telephone number and e-mail address, if any, of person to contact in the United Kingdom

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Notes

a) If you need help to fill in this form or you have any questions, please contact the Patent Office on 08459 500505.

b) Write your answers in capital letters using black ink or you may type them.

c) If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.

d) If you have answered YES in part 8, a Patents Form 7/77 will need to be filed.

e) Once you have filled in the form you must remember to sign and date it.

f) Part 7 should only be completed when a divisional application is being made under section 15(4), or when an application is being made under section 8(3), 12(6) or 37(4) following an entitlement dispute. By completing part 7 you are requesting that this application takes the same filing date as an earlier UK application. If you want the new application to have the same priority date(s) as the earlier UK application, you should also complete part 6 with the priority details.

Wireless Controlled Intelligent Outdoor Dimmer Module

The invention relates to a weatherproof, secure, remote controlled, intelligent, incandescent light dimmer module intended primarily for outdoor use, although it can also be used indoors. The module is used in conjunction with an industry standard NEMA L415 "twist lock" three terminal socket wired appropriately to any mains voltage tungsten incandescent lamp of load rating 40 to 300 Watts.

Remote controlled, intelligent, indoor light dimmers are well known. Due to various limiting factors, however, such as electric shock hazards, weather-proofing issues, controllability and overheating plus electronic circuit problems such as false triggering due to moisture formation on touch switch plates, the application has never migrated outdoors.

This invention enables existing indoor dimming technology to be brought outdoors and provides a convenient, safe, weatherproof, programmable, wireless remote, and secure means of controlling the light levels of outdoor mains voltage incandescent lamps. It overcomes the problems mentioned above by combining a watertight case (housing) with an integral industry standard three terminal NEMA L415 style connector. By incorporating a magnetically activated switch mounted inside the housing, there is no need for external conventional touch switches or push button switches, thus eliminating moisture, shock hazards, and false triggering issues. The dimmer utilises a microprocessor in its construction and hence many advanced features are possible. The microprocessor monitors both overload and overheating conditions and will take appropriate action to protect the electronics by shutting down the circuit in the event either condition is detected. The "soft start" (of the lamp) feature considerably lengthens the life of the bulb.

IGBT (Insulated Gate Bipolar Transistor) technology incorporated in the dimmer results in very low noise generated by this circuit.

The lamps can be switched on and off or be cycled from a low to a high or a high to a low light level by a single button press on the remote control.

Figure 1 shows a side view of the dimmer controller and magnetic wand.

A magnetically activated switch 1 is illustrated in Figure 1. This switch is used to set the module into program or "learn" mode. The module can be programmed to "learn" a remote control button (function), which is then used to control the dimmer. This gives the user unique (secure) control of that dimmer. Magnetically activating the "learn" mode reed or Hall effect switch by swiping a magnetic wand 2 a designated number of times in close proximity to it and transmitting the desired remote control signal to the module in the correct sequence performs this. The dimmer module can be reprogrammed as many times as required and all the stored settings will be retained for many years even if the power is removed due to the use of non-volatile memory within the dimmer circuit. The magnetically activated switch is connected to the dimmer circuit touch switch input resistor network and also the neutral mains terminal via a solder tag inside the housing. It is mounted between the heat sink and the inside wall of the housing. Notches are cut away from the heat sink fins to allow the switch to be connected inside to the Printed Circuit Board (PCB) and neutral terminal.

A magnetic wand 2 is used to activate the dimmer program mode switch. It consists of a handle with small magnet at one end. The wand is placed in close proximity to the program mode switch in the dimmer module and is swept past it a designated number of times in rapid succession to set the dimmer into program mode.

An aluminium heat sink 3 is designed in a turbine style to offer maximum surface area and to circulate the generated heat around the inside of the housing ensuring optimum heat transfer to the outside world. The heat sink has a circular flat top with an aperture cut out to accommodate an Infrared (IR) sensor 8 and a small hole drilled out to secure it to the bridge rectifier. One fin is used to secure the IGBT device directly to the heat sink. The dimmer PCB and internal mains terminals are completely surrounded (and isolated) on the top and sides by the heat sink 3.

A highly polished mirrored inverted cone 4 is fitted to the inside top of the module housing to reflect any stray IR back to the detector 8, widening reception angles and enhancing reception of IR transmissions to the dimmer module.

The main weatherproof housing 5 for the dimmer electronics and heat sink 3 is illustrated in Figure 1. It utilises a case made of UV stabilised polycarbonate or other suitable material facilitating the use of IR as well as Radio Frequency (RF) as a communications medium to or from the dimmer module.

Figure 1 also shows the standard NEMA L415 style three connector terminals 6 located on the base of the module housing 9. These terminals are used for Line In, Line Out and Neutral connections. The dimmer PCB is soldered down internally to solder tags connected to the line in and line out terminals. The main housing 5 is placed onto the housing base 9 and secured into place by gluing, ultrasonically welding or other appropriate means.

A neoprene (or other suitable material) foam ring 7 is stuck down to the underside of the housing base 9 (external side). This acts as a water resistant seal between a standard NEMA L415 style socket and the dimmer module terminals 6.

FIG 1